

MT PRIME



Appendix E

Detailed Descriptions of Alternatives

**Deloitte & Touche Consulting
Group**

Application Functionality

Current

- General Ledger
- Accounts Payable
- Payroll
- Position Control
- Personnel
- Benefits
- Budgeting
- Fixed Assets

Expanded

- General Ledger
- Accounts Payable
- Accounts Receivable
- Human Resource Information System
- Payroll
- Purchasing
- Budgeting/Forecasting
- Fixed Assets
- (Employee Time & Expense)
- (Inventory)
- (Cost Accounting)

Application Distribution

Centralized

Rationale for locating application code centrally are typically:

- ease of maintenance, since all application code is located in a central location, and
- proximity to central databases, so that network traffic is minimized as applications acquire and store data.

Distributed

Applications can be distributed as required according to several distribution criteria:

Geographically

Application servers may be located at major points throughout the State to ensure the application code is located in close proximity to the regional client users. This might be advantageous when a central processing function, such as revenue processing, is decentralized to a group of regional offices which deal with a large number of business functional areas.

Functional

Application servers may be located close to the department which is responsible for a specific business function and/or the owners of the data which support the function. Examples might include universities, land/resource management, project management or other functions which can be best served on a local basis.

Agency

Application servers may be located centrally in a specific agency and serve all (or many) of the agency's functional requirements from a specific hardware platform. Large agencies such as Transportation, State Fund and DPHSS already have servers dedicated to their needs.

Web-Enabled

A web-enabled application is one which has a knowledge of the Internet and new mechanisms for accessing data outside the enterprise. In future, this external information may be made available to the application through the use of application links which are provided by the vendor. In addition, web-based client applications will take advantage of web browser technologies to provide access to

Application Architecture

Mainframe Monolithic

The traditional technology environment where all applications and data are located on a single large processing complex and communicates with users as terminals (or terminal emulation) across a proprietary network. A very mature environment with proven facilities for security; automated operations; performance, configuration and capacity management; execution batch, on-line and time sharing processes; and software development environment.

Client-Server

A current technology environment where the application is divided into components called clients and servers.

The client component handles the user interface and screen handling processes and usually resides on a workstation.

The server components of the application are usually dedicated to serving:

1. the application's business rules (application servers);
2. the application's data and/or database requirements (data server), and

3. additional special requirements (communication server, print server, web server, security server, firewall, etc.).

Server components can reside on common or separate hardware platforms and may be located at any point on a fully distributed network.

In typical financial and HR systems today, the application is 2-tiered, meaning the application services are divided into a client component and a server component. The 2-tiered model is usually implemented on a single hardware server platform which provides both application and data services.

Newer application architectures incorporate multi-tier models which divide the application into two or more components. These 3-tiered (or n-tiered) architectures provide greater flexibility and portability as technology infrastructure components change or as changes to business rules are dictated by the enterprise.

A very new application model has emerged which extends the client-server architecture to incorporate the advantages of the Internet to deliver additional functionality and services. This "Web-Enabled" client-server architecture will likely become dominant in the packaged application software market over the next 2-3 years. Major software vendors should already be positioning their next product release to take advantage of the Internet and any packages selected today should be readily migrated into this

web-enabled context as the vendors release their enhanced products.

Object Oriented

This emerging technology provides a new method for encapsulating processes and their related data into a single component called an “object”. This object technology promises increased application portability and component reusability. Many technology vendors are now incorporating object technologies into their new product development cycles. A limited number of end-user organizations have embraced object technology to date due primarily to the steep learning curve associated with its use.

Data Architecture

Centralized

This model provides all data for all applications from a central data server (or mainframe). Suitable for cases where continuous access to data is required by agencies located all over the State.

Data Warehouse

A warehouse extracts operational data from legacy core systems or agency sub-systems and stores it in a more central, accessible or meaningful way . Typically , the warehouse stores data in a relational database management system for subsequent inquiry or reporting purposes and is refreshed daily or more frequently as the need dictates. Warehouses are also used to provide information to subsequent decision support systems or on-line analytical processing (OLAP) systems.

Partially Distributed

Data is distributed onto hardware servers located away from the central location to avoid bandwidth constraints or for greater user convenience. Typically the data is a snapshot copy of a central database for use by geographically or functionally distinct users. Reconciliation of these replicated databases provides a significant synchronization challenge which can be addressed by a “replication server” .

Fully Distributed

Fully distributed databases do not assume a central “master” copy of the data, but rather locate the data where it is of most immediate use. If the database is intentionally fragmented across the network, the network’s directory services must know the locations of the various data components and ensure that all related fragments can be accessed from any point on the network. Backup and restoration services for managing the integrity of distributed databases is an essential component of a fully distributed data environment.

Database Environment

Flat

Flat file structures allow access to data in a sequential mode only. No access is provided utilizing indexes. This reduces the utility of the data. Data is easily transferred between systems due to its simple nature. Backup of data is also relatively simple.

Network

Network databases provide access to data through sets of like data, as well as indexes. The word network in this context refers to the fact that data is stored by sets of related data rather than referring to networks such as Ethernet or Novell networks. System functionality can be enhanced by directly accessing the data needed. Transfer of data between systems is restricted due to the proprietary nature of the data storage mechanisms. Backing up the data requires proprietary tools.

Relational

Relational databases are based on relational theory as developed by Coad and others. Data is stored in tables much like spreadsheets and instances of data

are related through the use of like data values. Data is easily accessed either sequentially or through the use of indexes. Queries of the data are phrased using words which are similar to plain English. Backing up data requires proprietary tools. Transfer of data to other relational database systems is easily accomplished.

Object Oriented

This emerging technology provides a storage method for encapsulating processes and their related data into a single database component called an "object". This object technology promises increased database portability and component reusability. Many technology vendors are now incorporating object technologies into their new product development cycles. A limited number of end-user organizations have embraced object technology to date due primarily to the steep learning curve associated with its use.

Hardware Environment

Mainframe

Large central mainframe supporting a network (SNA) of users accessing monolithic applications from terminal or PC's using terminal emulation.

Open Server

A hardware platform whose operating system, file access methods, network access methods and utilities are based on industry standards (OSI, ANSI, SMTP/MIME, LDAP, X.500, etc.)

Single Server

An open hardware platform which provides application or database services for multiple clients from a single centralized location.

Distributed

An open hardware platform which provides application or database services for multiple clients located across a network.

LAN Server

A hardware server and network operating system (i.e. Novell or Windows/NT™) which provides application and/or data services to support for a group of clients attached to a Local Area Network (LAN).

Workstation Environment

Terminal

A data entry and on-line inquiry device with no local processing capabilities, usually text-based and directly connected to a mainframe or mini-computer or over proprietary networks.

PC-Intel

A personal computer (desktop or laptop) with local processing capabilities based on the Intel chipset. These devices typically run a variant of the Windows™ operating system as the client environment for most business applications. These PC devices usually communicate with servers via open telecommunications services (i.e. TCP/IP) or with mainframes using terminal emulation facilities.

Unix Workstation

A high-performance workstation which uses the Unix operating system for computationally intensive applications

Web Appliance

A device which has been specifically configured to act as a client on the graphic component of the Internet known as the World Wide Web.

Other

Devices such as personal digital assistants, display boards, consumer devices and other emerging technologies which enable remote and/or portable communications with servers.

Network Environment

SNA

The network topology, access methods and technologies which currently support terminals and PC's attached to the mainframe. SNA is a proprietary network protocol developed by IBM in the 1970's which does not conform to open standards.

SummitNet

A multi-protocol network which currently supports the open network protocol (TCP/IP) and also supports other non-IBM proprietary protocols (i.e. DECnet, Novell IPX). This network provides transport for all non-SNA government data traffic and provides access to the Internet via high-speed gateways located at the two major universities in the State. SummitNet provides a robust, modern and reliable telecommunications network for the deployment of distributed applications

Intranet

A subset of the multi-protocol network which provides Web-like access for specific users within the State. This logical network uses the transport infrastructure provided by SummitNet and Internet protocols to communicate between servers and clients.

Intranets look and feel like the World Wide Web without actually being openly accessible to the full Internet. Intranets are already implemented in some large State agencies and are being planned for others. Having an intranet to front-end the new core applications is a desirable system feature.

Solution Type

Enterprise-wide Single Solution

A single integrated state-wide solution that all agencies utilize for administrative process support

Best of Breed by Function

- Multiple statewide functional systems (that represent the best of breed in each individual functional area) used by all agencies to support administrative processes
- Individual systems would be integrated through custom-built interfaces

Narrow Multiple Options

- A few integrated solutions from which agencies could chose to utilize for administrative process support
- Agency would make selection from standard solutions depending upon individual size and complexity of agency

Multiple Agency-selected Solutions

- Agencies given complete autonomy to develop, select and implement solutions to support administrative processes
- Agency systems might be linked to a central data warehouse; however, administrative systems might not provide integrated functionality (depending upon agency choices)

Acquisition Method

Salvage and Enhance

Utilize existing technology platform and build additional custom applications to support business needs

Build All

Adopt new technology platform and build custom applications to support business needs

Build Some/Buy Some

- Adopt new technology platform
- Build limited custom applications to support specific business needs
- Purchase externally developed applications to support general business needs

Buy All

Adopt new technology platform and purchase externally developed applications to support business needs

Implementation Method

Insource

Implement systems solution utilizing internal technical resources

Outsource

Implement systems solution utilizing external technical resources

Cosource

Implement systems solution utilizing both internal and external technical resources

Support Method

Insource

Support and maintain systems solution utilizing internal technical resources

Outsource

Support and maintain systems solution utilizing external technical resources

Cosource

Support and maintain systems solution utilizing both internal and external technical resources